# SWIMMING POOL IMMERSED LIGHT FIXTURE

Cross-Reference To Related Applications -NOT APPLICABLE (N/A)

Statement Regarding Federally Sponsored Research Or Development - N/A

Reference To A Sequence Listing, A Table, Or A Computer Program Listing –N/A

Compact Disc Appendix - N/A

## Background Of The Invention

1. This invention is directed to an underwater lighting system for use with swimming pools, and to a light fixture particularly suited for use with above-ground pools.

2. An earlier form of immersed light, as marketed in the United States by Pentair pool products under the name "AquaLuminator" (Trademark), consists of a light fitting that is located in the wall of a pool, within and centrally of the water inlet.

The Pentair fitting has a divergent flow diffuser, to divert inflowing water around the outside of the light fitting. This arrangement serves as a significant restriction to the free flow of water entering the pool from the pump/filter circulation system, with a marked increase in back-pressure and consequent undesirable changes in the operating characteristics of that system.

## Brief Summary of the Invention

The present invention provides a submerged pool lighting system, with a light fitting that forms part of and is integrally combined with a pool service water connection.

The subject light fitting is combined with a circulation fitting such as the pool circulation water return fitting.

Thus, the subject light fitting is located in unitary adjoined relation with a pool circulation fitting, to provide a slender, flush-fitting light source immediately adjacent to,

and in substantially non-obstructing relation with a circulation fitting such that the flow characteristics of the pool circulation system are substantially unchanged.

In the preferred embodiment for an above-ground pool, the combined circulation/light fitting of the present invention incorporates a flow access fixture through the pool wall for the location of a connecting power cord, by which the light fitting is energized.

The light source for the subject system comprises a shallow, substantially planar, circular array of light emitting diodes (LED's), powered by way of a step-down transformer from a domestic supply, by way of a ground-fault circuit breaker for purposes of electrical safety.

The light emitting diodes may have a light colour emission selected from the group consisting of red, green and blue LED's, being mounted on a printed circuit board.

The use of red-green-blue LED's enables the use of a programmed system to provide selected colour outputs, rangingover a wide colour spectrum.

The use of an alternative light source such as a halogen light bulb is contemplated. This fits within the slender profile of the present light housing portion of the combined circulation fitting/pool light; also, a low voltage 12-volt supply circuit can be used.

Brief Description of the Several Views Of The Drawings

Certain embodiments of the present invention are described by way of illustration, without limitation of the scope of the invention thereto, other than as set forth in the present claims, reference being made to the accompanying drawings, wherein:

Figure 1 is a front elevation of a pool light fitting embodiment in accordance with the present invention;;

Figure 2 is a side elevation view in section, showing a wall portion of an above-ground

swimming pool with the subject combined light fitting/circulation fitting in schematic, diametrical section; and,

Figure 3 is a side elevation view of an alternative, streamlined embodiment, shown at a reduced scale..

Detailed Description of the Invention

Referring to Figures 1 and 2, a combined light fitting/circulation fitting 10 in accordance with the present invention has a flanged circulation fitting 12 with a water inlet portion16 for connection through the steel wall 18 of a pool. An annular "eyeball" directional nozzle is secured in the outlet of the fitting 12 by way of a threaded retaining ring 14.

The inlet portion 16 enables the attachment of a water line connection (not shown) to a filter and circulation pump (also not shown), by which the pool water is circulated and cleaned.

A light fitting portion 20 is integrally connected to the flange portion of the fitting 12, which includes two connecting web portions 22.

The light fitting portion 20 has a cylindrical body 24, containing an array of LED lights 26 mounted on a printed circuit board 28. An epoxy seal serves to waterproof the circuitry, enabling its submergence.

A connected power cord 30 includes spare turns of the cord 30 wound about a conical housing 32, to enable withdrawal of the light array 26 from the light fitting portion 20.

The power cord 30 extends through the flange portion 12 and a connection conduit 34 that forms a part of the water inlet portion 16, the conduit exiting at 36.

The power cord 30 is connected with a step-down transformer/rectifier 38 to provide a

12-volt D.C. output. For safety purposes, the power supply is obtained through an electrical outlet (not shown) equipped with a Ground Fault Circuit Breaker.

The light fitting portion 20 has an outwardly convex translucent lens 40 mounted on an annular gasket 42, and secured by screws 44.

The assembled LED array 26, with board 28 and lens 40 is secured within the body 24 by way of detent 48 which engages behind rib 58. A screw 60 secures the LED/lens array in place.

The inlet portion 16 projects through an aperture in the pool liner 50 and pool wall 18, being secured in place by a backing nut 52 screwed to the threaded inlet portion 16, ( the nut 52 being shown partially screwed home).

The nut 52 serves to sandwich and locally compress the pool liner 50 and an annular sealing gasket 54 into sealing engagement between the flange portion 12 and the pool wall 18.

If maintenance or replacement of the LED array 26 is required, this may be carried out without drain-down of the pool water. Removal of the screw 60 and disengagement of detent 48 permits the light array 26/28/40 to be removed from the housing portion 20. The spare turns of the cord 30 permit withdrawal of the light array above water, for servicing or replacement purposes.

A readily compressible foam gasket 46 adhered to the back of the light body portion 24 abuts the pool liner 50, serving to stabilize the installation.

In the Figure 3 embodiment, the side profile of the combined light fitting/circulation fitting 10' is unified, having a smooth curved profile with minimal protruberances, and affording substantially no hand-holds or foot-holds to users of the pool.

It is contemplated that the power cord 30 may project into the interior of the water inlet portion 16, without recourse to a connection conduit 34.